

(12) UK Patent Application (19) GB (11) 2 262 770 (13) A

(43) Date of A publication 30.06.1993

(21) Application No 9227063.6

(22) Date of filing 23.12.1992

(30) Priority data

(31) 9103911

(32) 27.12.1991

(33) ES

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(51) INT CL⁵

E05B 47/06

(52) UK CL (Edition L)

E2A AAR A103 A135 A420 A516

(56) Documents cited

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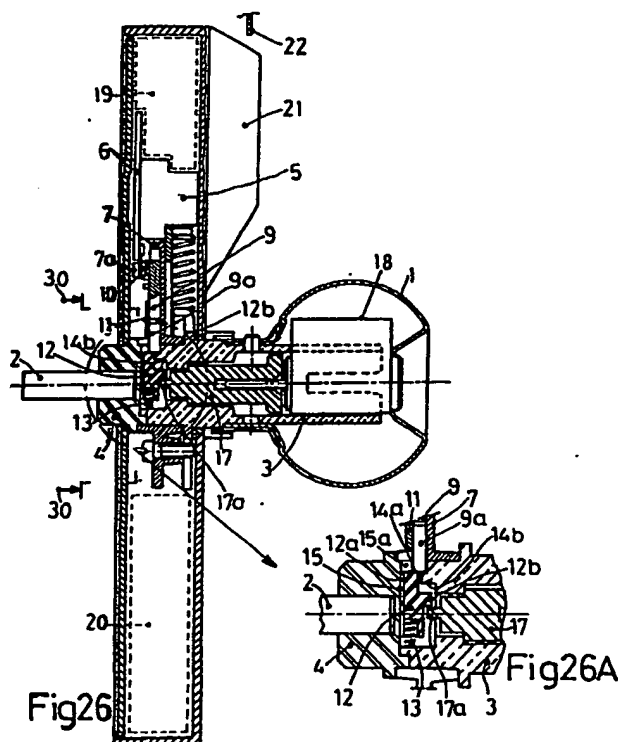
(58) Field of search

UK CL (Edition L) E2A AAR ALV

INT CL⁵ E05B

(54) A clutch device for electric locks

(57) A clutch device for electric locks has a tube supporting the outside knob/handle 1 made in two coaxial parts or semitubes 3, 4 comprising an external semitube 4 rotationally coupled to the square bar or shaft 2 operating the bolt, and an internal semitube 3 which is rotationally coupled to the knob/handle 1. The internal semitube 3 has incorporated within it, a spring loaded retractable clutch pin 12 the active point 12a of which is, in its radial, operational travel, capable of being inserted solely through a radial aperture 14a in the internal semitube disabling the knob/handle 1 from operation of the bolt, or also simultaneously through a second radial aperture 15a provided in the external semitube 4 in which condition the knob/handle is enabled and can operate the bolt. The clutch pin 12 is operated by an actuator 9 associated with a cam 6 and electric drive unit 5.



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A CLUTCH DEVICE FOR ELECTRIC LOCKS

This invention relates to a clutch device for electric locks.

SCOPE OF THE INVENTION

By "electric lock" is meant a lock in which inhibition and enablement of opening action, even though provided by mechanical means, are actuated by an electric motor or motor reduction unit, the energizing of which occurs as a result of the electrical/electronic validation of a coded means of opening, for example a magnetic strip card or the like.

The device which constitutes the object of this invention relates to an electric lock, such as the type frequently used for hotel rooms, interior doors in offices, etc., which is operated by knobs or handles fitted to appropriate tubes capable of rotating on supports fixed to the sides of the door, acting on a common shaft of square-bar, plate or like design, having the result of bringing about retraction of the locking bolt.

Operationally speaking, the type of lock referred to herein has a privacy function, in that opening from the inside is always possible by the simple action of turning the knob/handle, whereas the outside knob/handle remains rotationally inhibited until there takes place the validation of the magnetic card with the correct code or until there is operated an emergency mechanism provided to enable opening from the outside without using the valid magnetic card, for example when the user is locked in under conditions of distress and is unable to open. Thus, the clutch device now recommended is specially intended for an electric lock with knob/handle, capable of being freely operated from the inside and having an emergency device to enable rotation for opening from the outside in the absence of the valid coded means provided for this purpose.

PREVIOUS STATE OF THE ART

In the field of this invention all known lock mechanisms provide for rotational inhibition of closure via the outside knob/handle according to a single philosophy; this basically involves inserting, in the wall of the tub supporting such outside knob/handle, a radial bolt which is moved operationally by the action of the electric motor when the latter is energized by the insertion of the valid magnetic card. In the following description, the term "magnetic card" also includes any other medium with an electrical code or of electronic identification, since the use of a card, although preferable, does not condition the design or operativity of the recommended device, which is particularly concerned with the method of enabling opening/non-opening from the outside knob/handle, regardless of the means used to energize the motorized action necessary for such enablement.

Such known locking system suffers from lack of robustness and is capable of being forced, or at least damaged, with comparative ease, even during normal use thereof without any intention to break open the lock. This is due to the fact that, on the one hand, the tube supporting the knob/handle is designed according to its support function and does not have sufficient strength in relation to other mechanical stresses, such as those generated between its wall and the inserted bolt, when attempting to turn in locked condition; on the other hand, the bolt itself cannot be excessively robust either, because it is moved by an electric motor which, given the dimensions involved, is a very low-powered micromotor; furthermore, to emphasize the point made earlier, this locking system provides that in the locked condition the inability of the knob/handle to turn is determined by the fact that the bolt is inserted in the wall of its support tube, and each time that a turn is attempted there are set up considerable shear stresses between such bolt and tube, the more so since the knob/handle grip makes it possible to impart high

strength to the operation; lastly, it should also be borne in mind that these locks are used typically in entrance doors to hotel rooms, this representing an arduous duty involving very frequent usage which, in addition, is undertaken by a large number of different people (guests, employees, outside workers) and it often happens that its handling is not particularly delicate and careful, having regard to the transient nature of occupancy. As stated at the beginning, all this means that the locks are frequently damaged and can be easily forced.

EXPLANATION OF THE INVENTION AND ADVANTAGES

The new device now recommended conforms to a totally different concept, the basic philosophy of which is that inability to open is not brought about by rotational locking of the outside knob/handle but, quite the contrary, by ensuring that when the lock is secured the rotation of such knob/handle occurs freely, that is, without bringing about movement of the shaft/square bar.

To achieve this, the present invention provides a clutch device having a particular design in which the tube supporting the outside knob/handle is made in two coaxial parts or semitubes, that is, an enveloping external semitube rotationally coupled to the square bar or shaft operating the bolt, and an internal semitube which is rotationally coupled to the knob/handle, which internal semitube has incorporated within it, with radial guidance and spring loading, a retractable clutch pin the active point of which is, in its radial operational travel, capable of being inserted solely through a radial aperture in the internal semitube or also simultaneously through a second radial aperture provided in the external semitube, whilst at the same time at its front end such active point of the clutch

pin has, in an axial sense, a partial dimensional engagement with the active point of an actuator which in the part not engaged by such pin is also engaged axially by the edge of such aperture of the internal semitube, which actuator is radially guided in a static support and that, through a means of transmission of the drive, this actuator is operationally associated with the cam which is actuated by the appropriate electric motor reduction unit.

In this recommended design the dimensionality is such that, with the actuator in the position extended toward the rotary shaft of the knob/handle, its active point is simultaneously applied against the periphery of the internal semitube and against the active point of the clutch pin within a turning radius smaller than the interior of the aperture of the external semitube, so that the internal tube carrying the knob/handle is thus able to rotate freely without pulling the external semitube, which is the one attached to the shaft/square bar causing retraction of the bolt, while in the retracted position of such actuator the active point of the clutch pin is also located through the aperture of the external semitube, whereupon there is established a rotary link with the internal semitube which makes it possible to bring about opening by acting on the outside knob/handle.

In other words, the shaft/square bar used to withdraw the bolt is not now permanently linked in a rotational manner to the outside knob/handle but rather it is precisely when the lock is secured that both of them are uncoupled or declutched and the attempt to bring about opening translates into free rotation of the knob/handle which safeguards the mechanism against any forcing and, therefore, against any breakage or damage resulting therefrom; only when the lock is released does there occur the clutching action which brings together such shaft/square bar and outside knob/handle, allowing normal action

of withdrawal of the bolt.

Co-ordination of the clutched/declutched positions with the presence or otherwise of the valid magnetic strip card is achieved because such means of transmission of the drive for the actuator is in the form of a rocker with one arm joined to the actuator and the other arm joined to the cam operated by the motor reduction unit, so it is found that, with the lock secured, the position of such cam determines, via such rocker, the emergent position of the actuator in which the active point of the latter holds back the clutch pin, thus bringing about rotational uncoupling between the internal and external semitubes, this allowing free rotation of the outside knob/handle without pulling of the shaft/square bar which causes retraction of the bolt, while in the position with the lock released by validation of the magnetic card or like means of opening, energizing of the motor reduction unit moves the cam, thus bringing about by means of the rocker the retracted position of the actuator which allows the removal of the clutch pin in establishing the rotational coupling between such semitubes, enabling the opening of the lock by acting on the outside knob/handle.

It has already been mentioned that these locks may at all times be opened from the inside by simply turning the knob/handle, and also that opening from the outside requires the presence of the valid magnetic card and that in the absence of the latter the lock remains secured. It has also been stated that the lock incorporates a mechanism for emergency opening when there is an urgent need to open from the outside and the valid magnetic card is not available. The arrangement provided for this purpose according to the invention determines a particular configuration of the clutch pin which makes possible subsidiarily the establishment of the extended stop of this pin in conjunction with means external to the emergency mechanism itself.

Thus, according to the invention, such clutch pin has a lateral lug of which the two opposite faces in diametrical direction are respectively located with the outside one or that orientated toward the active point facing a radial stop provided internally in the internal semitube, and the inside one facing the end T bar of an axial emergency release device capable of rotating within such internal semitube and rotationally coupled to the rotor of a conventional combination drum, the dimensionality being such that, in the emergent position of the clutch pin, such lug is applied against such radial stop, while in the retracted position of the said clutch pin the lug is set against such T bar. The functionality of this emergency mechanism lies in that, with the clutch pin in its retracted position corresponding to the secured lock condition and in which such lateral lug is applied to the T bar, on actuating the opening turn on the drum there also rotates the emergency release device and its end T bar presses on such lug moving the forced extension of the clutch pin to its position of open lock or rotary coupling of the semitubes, without the need to operate the motor reduction unit.

These and other characteristics which result from the following detailed description make the present invention something new and different from everything known hitherto in this field.

DRAWINGS AND REFERENCES

For a better understanding of the nature of this invention, the attached drawings show a preferential form of industrial implementation, which is in the nature of a purely illustrative and non-restrictive example.

Figure 1 shows a vertical cross-section of an electric lock according to the invention, corresponding to the plan containing the virtual axis of knob/handle (1) and square bar (2), with the exception of actuator (a) which only appears sectioned at its upper part.

Figures 2 to 8 are views which, in the same position occupied by the overall assembly of Figure 1, show respectively internal (2) and external (3) semitubes; static support (4); sliding actuator (9); clutch pin (12) with its drive spring (13); retaining bridge (11) and emergency release device (17).

Figures 9 to 11 are corresponding views of internal semitube (3). Figure 9, like Figure 2, is shown according to the indication of Section (23) of Figure 11. Figure 10 is shown frontally to radial housing (14). Figure 11 is shown in upper plan view according to Figure 9.

Figures 12 to 14 are corresponding views of external semitube (4). Figure 12, like Figure 3, is shown according to the indication of Section (24) of Figure 13. Figure 13 is shown frontally to cylindrical housing (15). Figure 14 is shown in upper plan view according to Figure 13.

Figures 15 and 16 are corresponding views of static support (7). Figure 15, like Figure 4, is shown according to the indication of Section (25) of Figure 16. And Figure 16 is shown frontally to housing (8).

Figures 17 and 18 are corresponding views of sliding actuator (9), shown respectively according to Figure 5 (without sectioning) and frontally according to Figure 17.

Figures 19 to 21 are corresponding views of clutch pin (12). Figure 19, like figure 6, is shown according to the indication of Section (26) of Figure 20. Figure 20 is shown frontally to the lateral lug (12b). And Figure 21 is similar to Figure 19, but is only partly sectioned with regard to the receptacle for drive spring (13).

Figures 22 and 23 are corresponding views of retaining bridge (11). Figure 22, like Figure 7, is shown according to the indication of Section (27) of Figure 23. Figure 23 is shown frontally like Figure 25 of static support (7).

Figures 24 and 25 are corresponding views of emergency release device (17). Figure 24, like Figure 8, is shown according to the indication of Section (28) of Figure 25. Figure 25 is shown frontally to end T bar (17a).

Figures 26 and 27 are corresponding views of the lock according to the invention as a whole, showing the secured or released lock position. Figure 26, like Figure 1, is shown according to the indication of Section (29) of Figure 27. Figure 27 is a sectioned internal front view according to indication (30) of Figure 26.

Figures 26-A and 27-A are respective enlarged views of the surrounding details of figures 26 and 27.

Figures 28 and 29 are views similar to figures 26 and 27, but corresponding in this case to the open or clutched lock position.

Figures 28-A and 29-A are views similar to figures 26-A and 27-A, but for such open or clutched lock position.

Figure 30 is a view illustrating the change from Figure 27-A to 29-A when the outside knob/handle(1) is turned.

Figure 31 shows the automatic assumption of the clutched position upon reversing the rotation shown in Figure 30.

Figure 32 is a partial view according to Figure 1.

Figure 33 is a view shown according to the indication of Section (31) of Figure 32 and illustrates the non-active position of emergency T bar (17a).

Figure 34 is a view similar to Figure 33 which illustrates the operational action of such emergency T bar (17a).

In these figures the following references are indicated:

1. - Knob/handle.

- 2. - Operating shaft/square bar.
- 3. - Internal semitube supporting knob/handle (1).
- 4. - External semitube pulling shaft/square bar (2).
- 5. - Electric motor reduction unit.
- 6. - Drive cam of motor reduction unit (5).
- 7. - Static support.
- 7a. - Pivot for spring (10).
- 8. - Housing of support (7).
- 8a. - Aperture of housing (8).
- 9. - Sliding actuator.
- 9a. - Active point of actuator (9)
- 10. - Drive spring or flexible rocker.
- 11. - Retaining bridge for actuator (9).
- 11a. - Fixing screws for bridge (11).
- 12. - Clutch radial moving pin.
- 12a. - Active point of pin (12).
- 12b. - Lateral lug of pin (12).
- 13. - Pin drive spring (12).
- 14. - Radial end housing of internal semitube (3).
- 14a. - Radial aperture of housing (14).
- 14b. - Internal radial stop in housing (14).
- 15. - Cylindrical end housing of external semitube (14).
- 15a. - Radial aperture of housing (15).
- 16. - Peripheral angle stops for internal semitube (3).

- 17. - Emergency release device.
- 17a. - end T bar of release device (17).
- 18. - Drum actuating the release device (17).
- 19. - Electronic circuit.
- 20. - Electric power source.
- 21. - Magnetic card reader (22).
- 22. - Magnetic card.
- 23. to 31. - Indications of section.

DETAILED DESCRIPTION OF A FORM OF IMPLEMENTATION

In relation to the diagrams and references given in the attached drawings there is described a preferential form of implementation of the invention, concerning (Figure 1) an electric lock provided with a card reader (21) used to validate a magnetic strip card (22) by means of an electronic circuit (19) which brings about as a result the sequence of operation for motor reduction unit (5), the latter causing the movement of drive cam (6) which is utilized to move conveniently sliding actuator (9) which, being now part of the particular new device recommended, will determine the clutched and declutched positions described in detail hereinafter, this lock having of course incorporated therein the appropriate electric power source (20).

Up to movement of drive cam (6), the design described corresponds to the generality of other electric locks actuated by a magnetic card (22) or similar means of validation, in addition to which, mechanically speaking, the electric lock is of the type capable of being operated by means of appropriate inside and outside knobs/handles fitted in the respective tubes which are operationally related to a common operating shaft in the form of a square bar (2) (or plate, or the like) which on rotating causes the retraction of the

bolt. There is also general the functionality of being able to be opened from the inside by simply exerting rotary action, whilst the selective engagement of opening is established in relation to the outside knob/handle(1), as is also general the fact that there exists an emergency mechanism which allows opening from the outside without effecting electrical/electronic validation.

The particularity of the device recommended lies in the manner in which the movement of drive cam (6) is utilized to enable opening/non-opening via outside knob/handle(1), as well as to perform emergency opening also from the outside, all of which is as described hereinafter.

In the first place (figures 27 and 29), the movement of drive cam (6) acts on an arm of a flexible rocker spring (10) which has its other arm articulated to sliding actuator (9) which moves vertically in housing (8) of static support (7), causing its active point (9a) to pass through aperture (8a) in order to determine or otherwise a radial dimensional engagement with the tube carrying outside knob/handle(1). The retention of actuator (9) in housing (8) is effected by bridge (11) which is fixed to such static support (7) by means of screws (11a).

In the second place, such tube carrying outside knob/handle(1) is in reality comprised (figures 1, 26 and 28) of internal semitube (3) which accommodates knob/handle(1), and of external semitube (4) which is rotationally coupled to shaft/square bar (2) operating the bolt.

According to this invention, such two semitubes (3, 4) are capable of being coupled or clutched by selective rotation so that, on inserting a valid card (lock released) clutching takes place and it is possible to open by turning outside knob/handle(1), whilst in the absence of a valid card (lock secured) declutching takes place and, on manipulating to

open, outside knob/handle(1) rotates freely, without its semitube (3) pulling semitube (4) coupled to shaft/square bar (2) which brings about the retraction of the bolt.

To achieve this functionality, the internal (3) and external semitubes are coupled coaxially whilst their respective end radial housing (14) and cylindrical housing (15) are brought face to face in the complementary design of the operating housing of retractable clutch pin (12), spring-loaded by means of drive spring (13). In the secured lock position (absence of valid card -22-), sliding actuator (9) assumes its extended position (figures 26A and 27A) with its active point (9a) protruding until it bears on the periphery of internal semitube (3) where it engages aperture (14) of radial housing (14a) to maintain clutch pin (12) retracted against its spring (13). In this position, on manipulating outside knob/handle(1) it turns freely (against angular stops -16- of internal semitube -3-) within cylindrical housing (15) of external semitube (4) and opening does not take place (this still being possible via the inside knob/handle), with the particularity that attempts to open do no cause damage to any mechanism since the functional philosophy is based on the passive resistance exerted when the lock is secured, unlike other currently known mechanisms which set up an active resistance with rotary locking by engagement of a radial bolt. On the other hand, in the released lock position (presence of valid card -22-) actuator (9) assumes its inhibited position (figures 28A and 29A) with its active point (9a) located beyond the periphery of external tube (4), thus enabling active point (12a) of clutch pin (12) to become inserted in radial aperture (15a) of cylindrical housing (15), so that when outside knob/handle(1) is now manipulated (again, as always, from the outside) pulling of external semitube (4) does occur, and normal opening of the lock takes place. The extended position of clutch pin (12) is delimited by its own lateral lug (12b) against radial stop (14b) provided internally within internal semitube (3) which is,

preferably, the actual inside wall of the latter.

This simple, efficient and reliable device as recommended allows unco-ordinated action, which is very useful having regard to its usual applications in hotel room doors, where it is manipulated by all sorts of people, in a very large number, who subject it to very severe stress in terms of the number of manipulations and, frequently, in terms of the lack of careful handling thereof. Thus, for example, when (figures 30 and 31) a valid magnetic card (22) is inserted after having turned (Figure 30) outside knob/handle (1), actuator (9) retracts its active point (9a), and active point (12a) of clutch pin (12) cannot come out, but it will do so immediately when on attempting to open it comes (Figure 31) up against radial aperture (15a) of cylindrical housing (15).

Emergency operation (figures 33 and 34) is brought about by the rotation of T bar (17a) of release device (17), pushing on lateral lug (12b) of clutch pin (12) and overcoming the action of spring (10) on the withdrawal of active point (9a) from actuator (9). The operational rotation of T bar (17a) can be provided, for example, by the rotation of a drum (18) operated by a key. On removing the key the secured lock condition will be restored, unless drum (18) makes it possible to remove the key in the active rotated position, in which case the emergency opening condition will be maintained.

Having sufficiently described the nature of this invention, as well as its industrial implementation, it only remains to add that in its assembly and constituent parts it is possible to introduce changes of form, material and arrangement within the scope of the invention, provided that such alterations shall not detract from its basic design. The applicant, under the terms of the International Conventions on Patents Rights, reserves the right to extend this application to foreign countries, applying thereto the date of priority of this application.

CLAIMS

1. A clutch device for electric locks, being locks capable of being manipulated by a knob or handle which in any case may be released by simply turning the internal knob/handle and which on their outside knob/handle have a mechanical rotation-inhibiting device actuated electrically under the action of a magnetic strip card or like medium with electric/electronic coding, characterized in that the tube supporting the outside knob/handle(1) is made in two coaxial parts or semitubes, that is, an external or enveloping semitube (4) rotationally coupled to the square bar or shaft (2) operating the bolt, and an internal semitube (3) which is rotationally coupled to the knob/handle(1), which internal semitube (3) has incorporated within it, with radial guidance and spring (13) loading, a retractable clutch pin (12) the active point (12a) of which is, in its radial operational travel, capable of being inserted solely through a radial aperture (14a) in internal semitube (3) or also simultaneously through a second radial aperture (15a) provided in external semitube (4), whilst at the same time at its front end such active point (12a) of clutch pin (12) has, in an axial sense, a partial dimensional engagement with the active point (9a) of an actuator (9) which in the part not engaged by such pin (12) is also engaged axially by the edge of such aperture (14a) of internal semitube (3), which actuator (9) is radially guided in a static support (7) and in that, through a means of transmission of the drive (10), this actuator (9) is operationally associated with the cam (6) which is actuated by the appropriate electric motor reduction unit (5), the dimensionality being such that, with actuator (9) in the position extended toward the rotary shaft of knob/handle(1), its active point (9a) is simultaneously applied against the

periphery of internal semitube (3) and against the active point (12a) of clutch pin (12) within a turning radius smaller than the interior of aperture (15a) of external semitube (4), so that internal tube (3) carrying knob/handle(1) is thus able to rotate freely without pulling external semitube (4), which is the one attached to shaft/square bar (2) causing the retraction of the bolt, while in the retracted position of such actuator (9) the active point (12a) of clutch pin (12) is also located through the aperture of external semitube (4), whereupon there is established a rotary link with internal semitube (3) which makes it possible to bring about opening by acting on outside knob/handle(1).

2. A clutch device for electric locks according to the previous claim, characterized in that such means of transmission of the drive (10) for actuator (9) is in the form of a rocker with one arm joined to actuator (9) and the other arm joined to cam (6) operated by motor reduction unit (5), so it is found that, with the lock secured, the position of such cam (6) determines, via such rocker (10), the emergent position of actuator (9) in which the active point (9a) of the latter holds back clutch pin (12), thus bringing about rotational uncoupling between the internal (3) and external (4) semitubes, this allowing free rotation of the outside knob/handle(1) without pulling of the shaft/square(2) bar which causes retraction of the bolt, while in the position with the lock released by validation of magnetic card (22) or like means of opening, the energizing of motor reduction unit (5) moves cam (6), thus bringing about by means of rocker (10) the retracted position of actuator (9) which allows the removal of clutch pin (12) in establishing the rotational coupling between such semitubes (3,4), enabling the opening of the lock by acting on outside knob/handle(1).

3. A clutch device for electric locks according to claim 2, characterized in that, preferably, such means of transmission of rocker (10) is a flexible spring which oscillates

on a pivot (7a) of static support (7), located between such cams (6) and actuator (9), such spring (10) being provided with two arms of which one is articulated to cam (6) and the other to actuator (9).

4. A clutch device for electric locks according to the previous claims, characterised in that such clutch pin (12) has a lateral lug (12b) of which the two opposite faces in diametrical direction are respectively located with the outside one or that orientated towards active point (12a) facing a radial stop (14b) provided internally in internal semitube (3), and the inside one facing end T bar (17a) of an axial emergency release device (17a) capable of rotating within such internal semitubes (3) and rotationally coupled to the rotor of a conventional combination drum (18), the dimensionality being such that, in the emergent position of clutch pin (12), such lug (12b) is applied against such radial stop (14b), while in the retracted position of the clutch pin (12) lug (12b) is set against such T bar (17a).

5. A clutch device for electric locks according to the previous claims, characterized in that, with clutch pin (12) in its retracted position corresponding to the secured lock condition and in which such lateral lug (12b) is applied to T bar (17a), on actuating the opening turn on drum (18) there also rotates emergency release device (17) and its end T bar (17a) presses on such lug (12b) moving the forced extension of clutch pin (12) to its position of open lock or rotary coupling of semitubes (3,4) without the need to operate motor reduction unit (5).

6. A clutch device for electric locks according to claim 4, characterised in that such radial stop (14b) is the actual internal wall of internal semitube (3).

7. A clutch device for electric locks according to the previous claims, characterised

in that the operational movement of clutch pin (12) takes place in a cavity formed complementarily by both semitubes (3,4), by means of respective end housing which take the form, in the manner in which they are located face to face, of coaxially-coupled cups and which are: a radial housing (14) of internal semitube (3) which incorporates aperture (14a) and stop (14b) and in which there penetrates, via its bottom, end T bar (17a) of the emergency release device; and a cylindrical housing (15) having its bottom set against the radially-sliding extreme side of clutch pin (12) and provide with an appropriate aperture (15a) for the active point (12a) of such clutch pin (12).

8. A clutch device for electric locks according to the previous claims, characterized in that, in an axial sense, operational sliding of actuator (9) occurs between the bottom of its radial and guiding housing (8) in support (7) and a moving retaining bridge (11) which partly covers the open front of such housing (8).

9. A clutch device for electric locks according to the previous claims, characterized in that, in relation to the radial aperture (14a) of internal semitube (13) and symmetrically on either side thereof, there exist respective radial lugs constituting angle stops (16) which limit the rotation of such internal semitube (3) in relation to the active point (9a) of actuator (9) when it is in its emergent position of lock secured and free rotation of internal semitube (3) which carries knob/handle (1), which will become operational upon failure of the other intrinsic mechanisms for angular limitation of travel.

10. A clutch device for electric locks, in which the tube supporting the outside knob/handle is made in two coaxial parts or semitubes, that is, an enveloping external semitube rotationally coupled to the square bar or shaft operating the bolt, and an internal semitube which is rotationally coupled to the knob/handle, which internal

semitube has incorporated within it, with radial guidance and spring loading, a retractable clutch pin the active point of which is, in its radial operational travel, capable of being inserted solely through a radial aperture in the internal semitube or also simultaneously through a second radial aperture provided in the external semitube, whilst at the same time at its front end such active point of the clutch pin has, in an axial sense, a partial dimensional engagement with the active point of an actuator which in the part not engaged by such pin is also engaged axially by the edge of such aperture of the internal semitube, which actuator is radially guided in a static support and that, through a means of transmission of the drive, this actuator is operationally associated with the cam which is actuated by the appropriate electric motor reduction unit.

11. A clutch device for electric locks substantially as described herein with reference to the drawings.

Patents Act 1977
 Examiner's report to the Comptroller under
 Section 17 (The Search Report)

19

Application number

GB 9227063.6

Relevant Technical fields

(i) UK Cl (Edition L) E2A (AAR; ALV)

(ii) Int Cl (Edition 5) E05B

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

P A MAKIN

Date of Search

17 FEBRUARY 1993

Documents considered relevant following a search in respect of claims 1-11

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X, Y	US 5027629 (LIU) See particularly Figure 4 and column 5, lines 3-16	1, 10
X, Y	US 4995248 (LIU) See particularly Figure 4	1, 10
Y	US 4429556 (KAMBIC) Whole document	1, 10

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

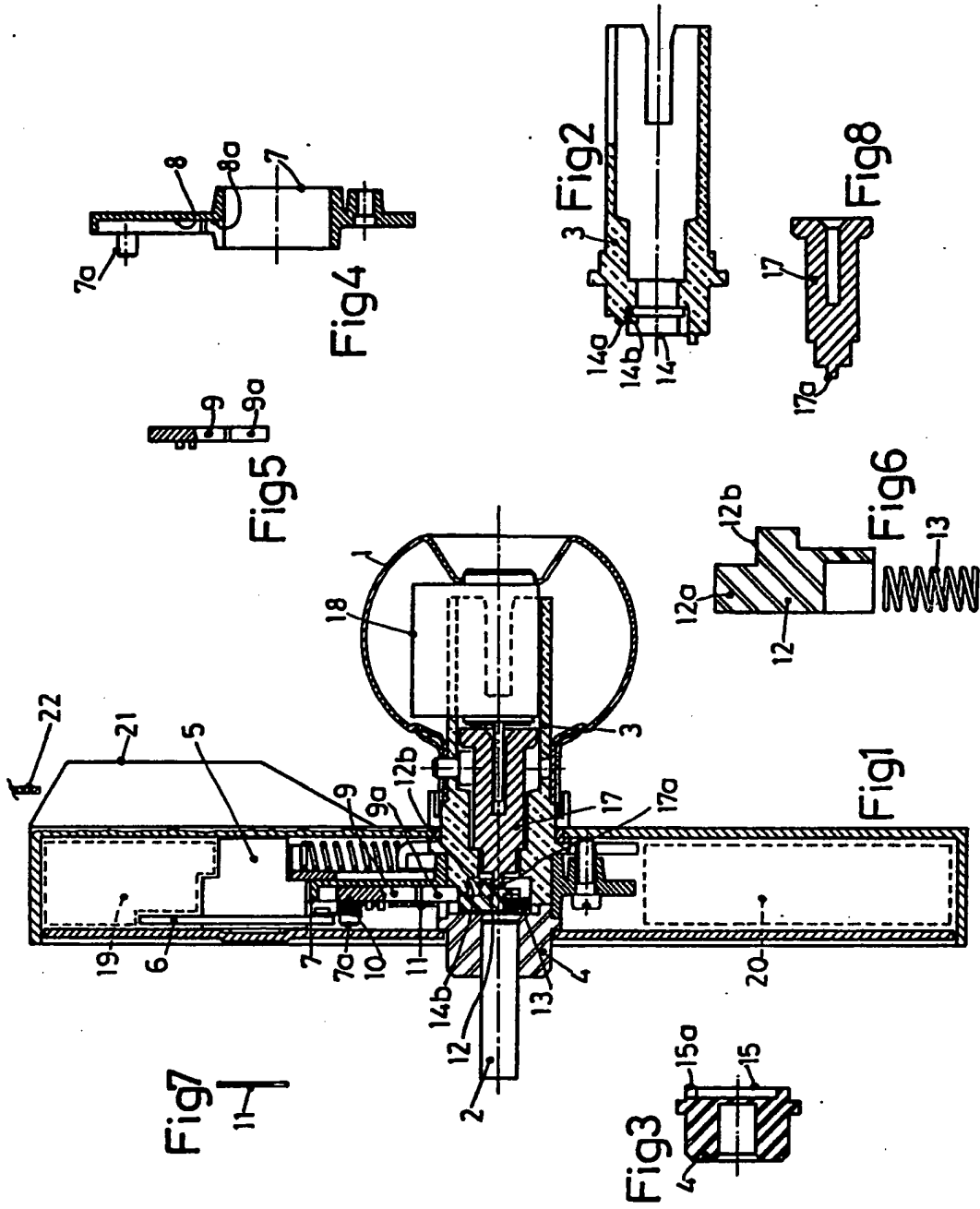
A: Document indicating technological background and/or state of the art.

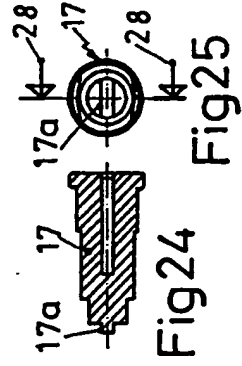
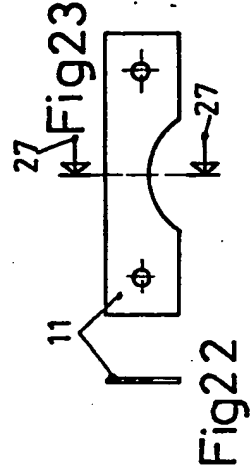
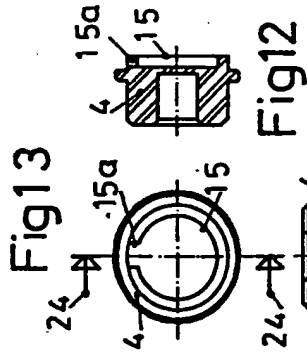
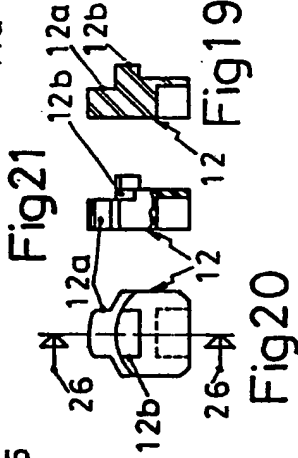
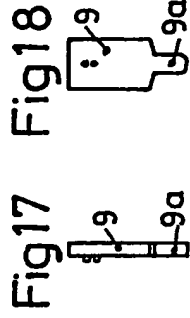
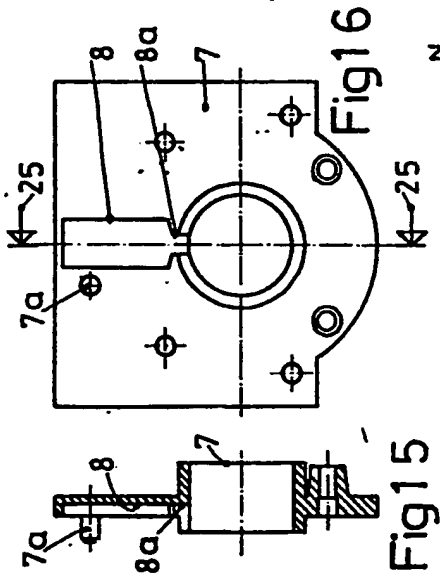
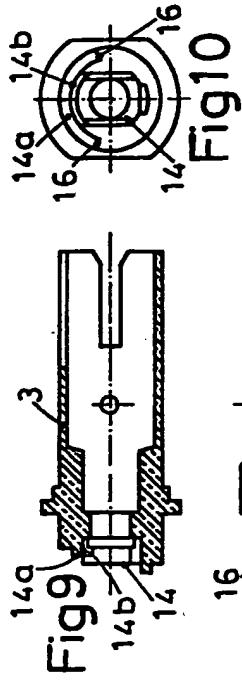
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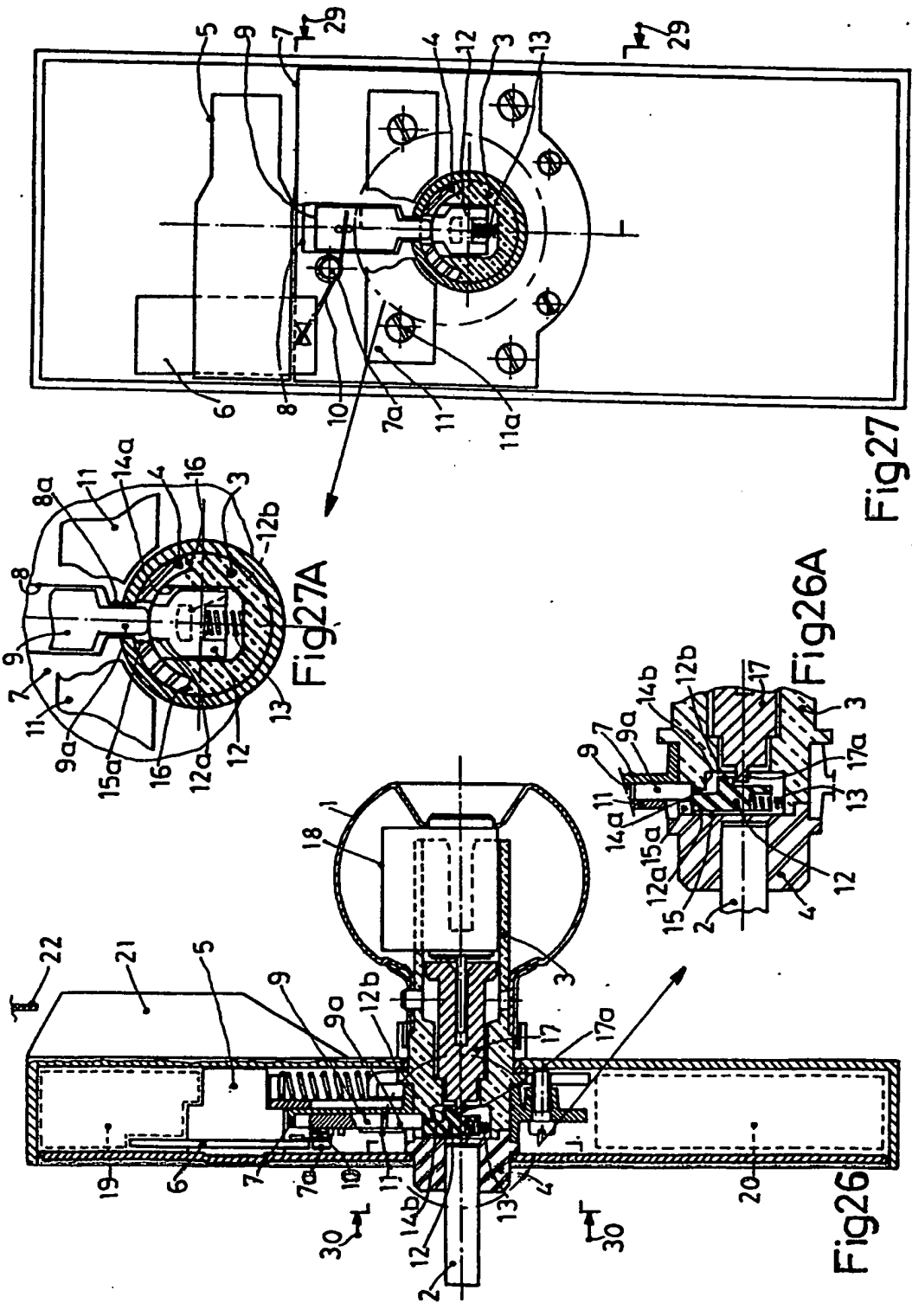


Fig 27

Fig 26A

Fig 26

Fig 27A

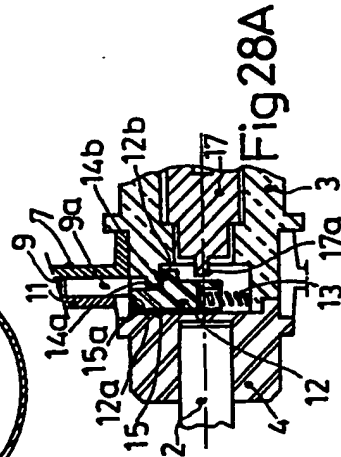
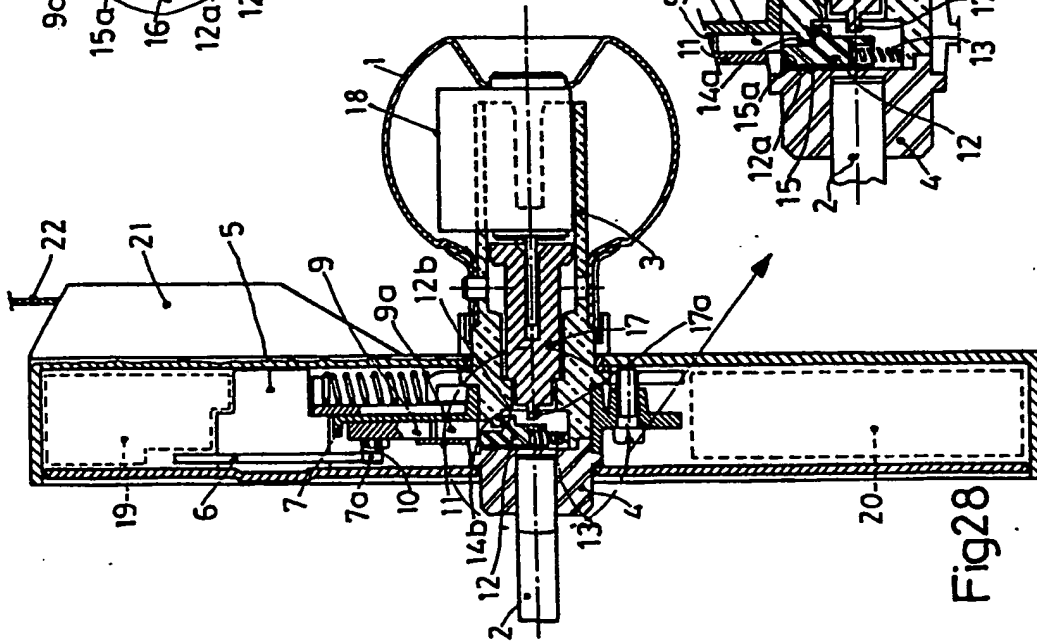
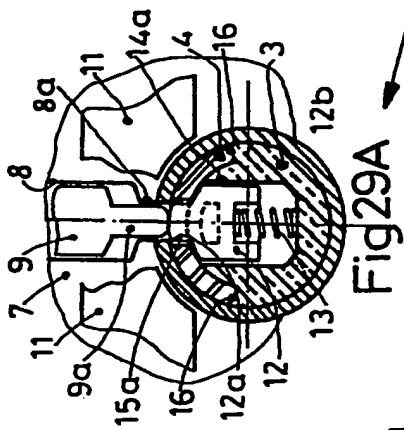
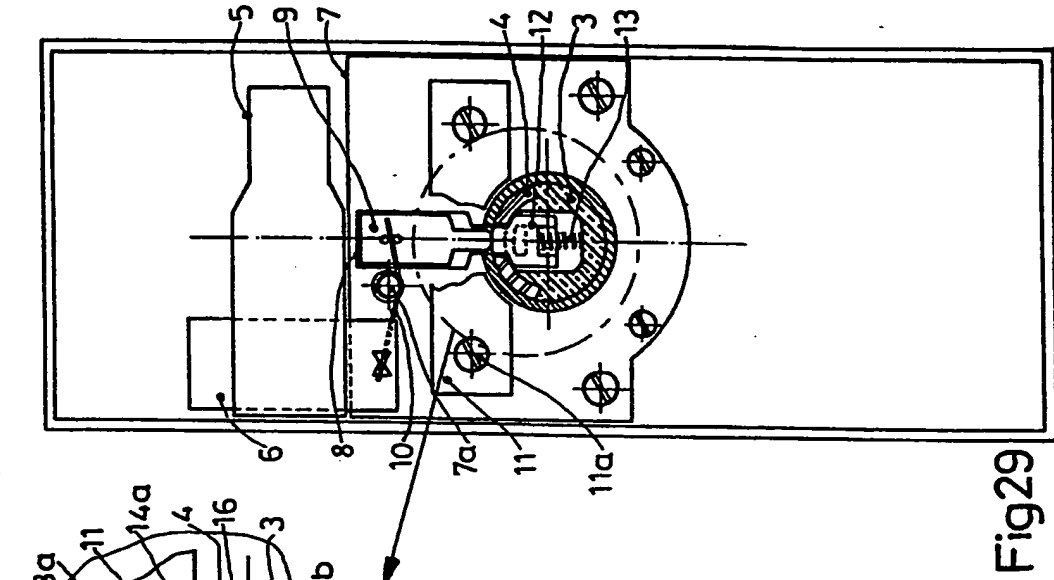


Fig30

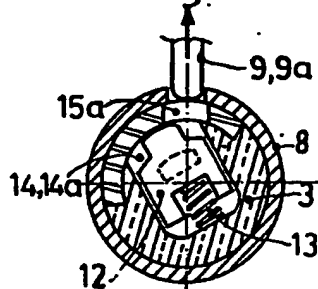


Fig31

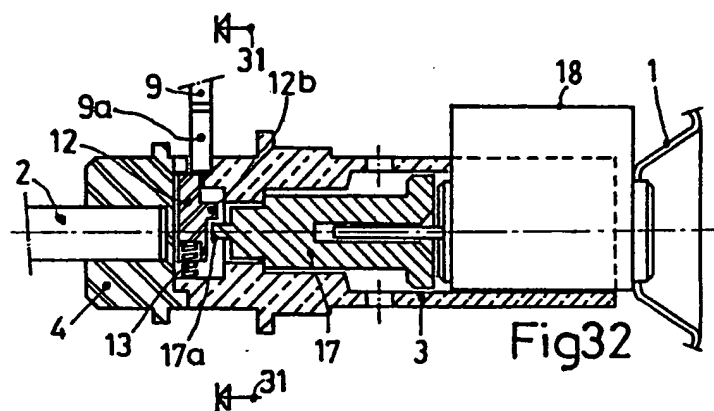
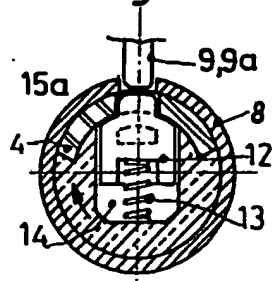


Fig32

Fig33

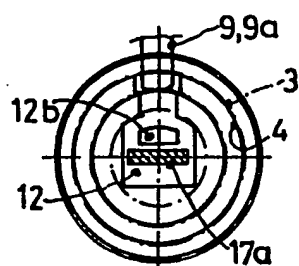


Fig34

